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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/619,264	07/19/2000	Aruna B. Kumar	60237	1298
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DIGIMARC CORPORATION 19801 SW 72ND AVENUE SUITE 250 TUALATIN, OR 97062				
			EXAMINER DASTOURI, MEHRDAD	
			ART UNIT 2623	PAPER NUMBER 20

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/619,264

Applicant(s)

KUMAR, ARUNA B.

Examiner

Mehrdad Dastouri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>19</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 2, 2004 has been entered.

Response to Amendment

2. Applicant's amendment filed February 2, 2004, has been entered and made of record.

Response to Arguments

3. Applicant's arguments filed February 2, 2004, have been fully considered but they are not persuasive.

Regarding Claim 1, Applicant argues that Lubawy (Prior art of record) does not even hint at encoding through modulation of surface microtopology, nor does it suggest reading structure to accomplish such.

The Examiner disagrees and indicates that Lubawy clearly discusses relation between printer's mode of operation and structure or microtopology of print media based on different ink absorbance (Column 1, Lines 29-53; Column 3, Lines 4—7). The printer reads the media-type identifier (which represents the microtopology of print media) carried on a sheet. Lubawy's invention encodes the microtopology information

of print media on print media. Synthesizing microtopology information of print media (as one signal) on print media image (a second signal) is also considered modulation of the signals. Rhoads patent 5,850,481 is a statutory bar reference as defined in 35U.S.C. 102(b). Teachings of Rhoads patent, in the same field of endeavor, are merely cited for explicit disclosure of recited limitation of modulation of surface microtopology.

Regarding Claim 4, Lubawy (Prior art of record) expressly recites the steganographic information encoded on the paper is invisible to the naked eye (Column 1, Lines 63-67, Column 2, Lines 1-2). Any further processing to decode the embedded information does not change the invisible characteristics of this watermark (Column 2, Lines 3-15). Furthermore, claim language does not recite invisible watermark resistant to ultraviolet radiation.

In the absence of the aforementioned limitation, Lubawy's machine readable invisible embedded information will not betray (show accidentally, reveal or disclose) the existence of the steganographic message.

Regarding Claims 7 and 16, it is respectfully submitted that in performing different printer control operation, optimization is inherently included (e.g., Lubawy, Column 3, Lines 60-67, Column 4, Lines 1-27). Consequently, Lubawy teaches optimization of printer operation. Controlling printer resolution is extremely well known in the art. Ta's invention is merely cited for explicit indication of resolution as the printer control parameter.

Regarding Claim 15, Lubawy clearly teaches that printer's mode of operation is a function of print media in accordance to ink absorbance (number of droplets of different

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color components or paper-bleeding coefficient) of the print media (Column 1, Lines 29-53; Column 3, Line 63 through Column 4, Line 28).

Rejection of Claims 21 and 22 have been rephrased to avoid any discrepancy.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 4-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Lubawy et al., (hereinafter Lubawy), U.S. 6,353,479.

Regarding Claim 4, Lubawy teaches a paper medium (photo media, Column 1, Lines 39-41, print media, Column 1, Line 63) carrying a steganographic message (invisible to the naked eye, Column 2, Lines 1-2), the steganographic message including printer control information related to the paper medium that is readable by a machine (machine readable information (bar code), Column 1, Lines 65-66; Column 4, Lines 55-63) from an image captured of at least a portion of the paper medium (margin, Column 2, Lines 3-6), and that is operable to control (Column 7, Lines 1-16) a printer so as to optimize print quality for physical characteristics of the paper medium (Column 1, Lines 63-66), wherein the steganographic message is encoded in the form of a digital watermark ("machine readable information", Figure 1, element 40; Column 2, Lines 27-

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28, "media-type information" = "identifier code", then Column 2, Lines 65-66, "the identifier code is comprised of twelve binary data bits"), wherein the digital watermark does not betray the existence of the steganographic message (machine readable embedded information will not betray (show accidentally, reveal or disclose) the existence of the steganographic message.).

Regarding Claim 5, Lubawy teaches the paper medium of Claim 4 wherein the digital watermark is embedded on the paper medium using an invisible ink (Column 1, Line 66, Column 2, Lines 1-5).

Regarding Claim 6, Lubawy teaches the paper medium of Claim 4 wherein the digital watermark (machine readable information (barcode), Column 1, Lines 65-66, Column 4, Lines 55-63) is repeated throughout at least a portion (margin) of the paper medium (Figure 1; Column 6, Lines 4-6).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubawy et al., (hereinafter Lubawy), U.S. 6,353,479 in view of Rhoads (U.S. 5,850,481).

Regarding Claim 1, Lubawy discloses a paper medium (photo media, Column 1, Lines 39-41, print media, Column 1, Line 63) including a surface having a

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steganographic message encoded thereon (Column 1, Lines 63-67, Column 2, Lines 1-2), the steganographic message being encoded through synthesizing the signals including the surface's microtopology (Column 1, Lines 29-53, e.g., different ink absorbance; Column 3, Lines 4-7. The printer reads the media-type identifier (which represents the microtopology of print media) carried on a sheet. Lubawy's invention encodes the microtopology information of print media on print media. Synthesizing microtopology information of print media (as one signal) on print media (a second signal) is considered a type of modulation of the signals.), the steganographic message including printer control information (color mapping, Column 1, Lines 37-53) related to the paper medium that is readable by a machine (machine readable information (barcode), Column 1, Lines 65-66, Column 4, Lines 55-63) from an image captured of at least a portion of the paper medium (margin, Column 2, Lines 3-6), and that is operable to control a printer (Column 7, Lines 1-16) so as to optimize print quality for physical characteristics of the paper medium (Column 1, Lines 63-66).

Lubawy discloses a signal manipulation utilizing surface microtopology equivalent to encoding through modulation of the surface's microtopology. However, Rhoads teaches:

steganographic messages being encoded through modulation of the surface's microtopology (Column 16, Lines 61-64; Column 17, Lines 2-12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to read the differences in the microtopology of a media-type surface as taught by Rhoads to provide the printer control information as taught by

Lubawy in yet another manner that is both imperceptible and potentially easier to implement than the infrared or ultraviolet reflective inks of Lubawy.

As Claim 2, Lubawy teaches:

The paper medium of Claim 1 wherein the printer control information (barcode, Column 4, Lines 38-45) includes one or more identifiers that are used to look up (Column 2, Lines 32-33; Figure 2) printer control information used to optimize printer operation for the paper medium (Column 2, Lines 65-67, Column 3, Lines 1-6).

As Claim 3, Lubawy teaches:

the paper medium of Claim 1 wherein the printer control information (data matrix) includes paper characteristics information of the paper medium (normal, Column 3, Line 63; photo, Column 4, Line 10; transparency, Column 4, Line 21).

As Claim 15, Lubawy teaches:

a paper medium (photo media, Column 1, Lines 39-41, print media, Column 1, Line 63) carrying a steganographic message (Column 2, Lines 1-2, steganographic message is invisible to the naked eye.), the steganographic message including printer control information related to at least a paper-bleeding coefficient of the paper medium (different ink absorbance of paper medium, Column 1, Lines 29-53; Column 3, Line 63 through Column 4, Line 28), the printer control information being readable by a machine (machine readable information (bar code), Column 1, Lines 65-66; Column 4, Lines 55-63) from an image captured of at least a portion of the paper medium (margin, Column 2, Lines 3-6), and the printer control information being operable to control (Column 7,

Lines 1-16) a printer so as to optimize print quality for the paper-bleeding coefficient of the paper medium (Column 1, Lines 63-66).

8. Claims 7, 10-12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubawy et al., (hereinafter Lubawy), U.S. 6,353,479 in view of Ta et al., (hereinafter Ta), U.S. 5,500,715.

Regarding Claim 7, Lubawy teaches:

an image sensor for capturing an image of print media (Column 2, Lines 3-5 and 10-15);

a steganographic decoder (Column 5, Lines 2-7, 22-25) for reading a steganographic message from the image of the print media (Column 2, Lines 25-28; Column 4, Line 64 through Column 5, Line 7), the message including printer control information for optimizing printer operation for the print media (Column 3, Lines 60-67, Column 4, Lines 1-27; Column 5, Lines 21-25)

However, Lubawy does not teach where an optimization relates to print resolution; But

Ta teaches:

wherein optimization relates to print resolution (Column 7, Lines 55-59).

Ta teaches Print resolution is a regularly changed printer control parameter due to the wide variety of computer/printer applications (Column 7, Lines 52-55).

Lubawy goes on to teach:

a printer control unit (Figure 1, element 34, Column 4, Lines 2-8) in communication with the decoder (Column 5, Lines 2-7, 22-25) for receiving the printer

control information and using the information to optimize (via look-up table, Column 5, Lines 35-43) print resolution (Ta, Column 7, Lines 55-59) to accommodate physical characteristics for the print media (normal, transparency or photo, Column 3, Line 60 through Column 4, Line 27).

Lubawy's media-type identifier code is used to as an input to a printer look-up table (Column 2, Lines 31-34) that then uses the information to select the correct print mode for the type of media.

Lubawy goes on to teach that the identifier code can also be used for "particular print media that require print modes that are different from other media of the same type" (Column 5, Lines 42-46), so this suggests that various printer parameters can be changed.

Ta teaches a system that allows users to choose the printer parameters and that one of those parameters is printer resolution (Column 7, Lines 45-60).

It would have been obvious to one of ordinary skill in the art to use the suggestion that multiple parameters may have to be changed to accommodate all of the different formats of a single media-type that a more efficient and automated way to accomplish the selection of printer parameters would be to create a specific identifier code for the media and allow the system of Lubawy to automatically set the proper printer parameters.

As per Claim 10, Lubawy teaches:

wherein the printer control unit uses the printer control information used to control the operation of the printer (Column 3, Line 60 through Column 3, Line 28).

As per Claim 11, Lubawy teaches:

including a computer connected to a printer; wherein the decoder comprises program code executing on the computer (Figure 1, Column 3, Lines 38-45).

As per Claim 12, Lubawy teaches:

wherein the decoder comprises a watermark decoder (Column 2, Lines 10-15; Column 5, Lines 2-8 and 21-25).

As per Claim 14, it recites substantially the same limitations as Claim 12 above and analogous remarks apply.

As per Claim 16, it recites substantially the same limitations as Claim 7 above and analogous remarks apply.

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubawy and Ta as applied to Claim 7, further in view of Kim et al. (hereinafter Kim), US 6,276,771.

As per claim 8, Lubawy does not specifically teach that his ink jet printer is part of a multifunctional device. However, Kim teaches that inkjet printer features can easily be incorporated in a multifunctional device design. Kim teaches:

wherein the image sensor is part of a scanning subsystem in a multifunction device having a printing-subsystem (printer module, abstract) and a scanning subsystem (scanner module, abstract) (Column 1, Lines 45-55).

It would have been obvious to one of ordinary skill in the art to utilize the features of Lubawy and Ta in the multifunction office equipment of Kim to eliminate errors and minimize wasting print media and toner that result from manually selecting the wrong

print mode. Incorporation of Lubawy's system into Kim's provides consumers who desire multifunction devices to benefit from Lubawy's invention.

As per Claim 9, Kim teaches:

wherein the image sensor comprises at least one of a CCD Array and a CMOS array (Column 3, Line 49).

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lubawy and Ta as applied to Claim 7, further in view of Cox, U.S. 5,848,155.

As per Claim 13, it recites substantially the same limitations as Claim 7 above and analogous remarks apply. However, two limitations of claim 13 differ from those of claim 7 and need to be addressed.

As stated above in the rejection of claim 4, Lubawy teaches.

providing a digitally watermarked sheet of print to the printer (Column 5, Lines 23-24), wherein a digital watermark in the digitally watermarked sheet of print media is an identifier ("machine readable information", Figure 1, element 40, Column 2, Lines 27-28, "media-type information" = "identifier code", then Column 2, Lines 65-66, "the identifier code is comprised of twelve binary data bits").

The other limitation taught by Lubawy is: using the printer control information to index (look up table, Column 2, Lines 30-34) corresponding printer operating parameters which relate to physical characteristics of the print media and adapting operation of the printer in accordance with the parameters (Column 2, Lines 40-51; Column 5, Lines 42-51).

However, Lubawy and Ta do not disclose the watermark as some spread spectrum binary bits. Spread spectrum watermarking is well known in the art as disclosed by Cox (Figures 1-3; Column 1, Lines 30-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lubawy and Ta's invention according to the teachings of Cox to incorporate spread spectrum watermarking because it is a well known methodology routinely implemented in the art to insert robust watermark to prevent software and hardware devices directly read the embedded signals (Cox; Column 1, Lines 30-48).

11. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubawy and Ta, as applied to claims 7 and 16 above, further in view of Brenner et al., (hereinafter Brenner), U.S. 6,318,827.

As per Claims 21 and 22, Lubawy and Ta do not disclose further limitations of Claims 21 and 22.

Brenner teaches:

wherein the optimal resolution is determined at least in part on an image to be printed to print media (Column 3, Lines 17-24)

It would have been obvious to one of ordinary skill in the art to use the preset print parameters for a specific print mode as taught by Brenner in the look-up table system of Lubawy and Ta to provide a selection of print modes intended to achieve the best quality and that involve the use of media that is susceptible to print quality degradation due to ink drop placement misalignment (Brenner, col. 6, 11. 14-20)

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Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**MEHRDAD DASTOURI
PRIMARY EXAMINER**



Mehrdad Dastouri
Primary Examiner
Art Unit 2623
April 18, 2004